

TANAIS ROBUSTUS, A NEW SPECIES OF ANISOPODA.

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In August, 1892, the collectors of the Marine Biological Laboratory of the University of Pennsylvania, at Sea Isle City, N. J., brought in a large logger-head turtle, *Thalassochelys caretta*.

Examination showed its carapace to be burdened with a miscellaneous collection of invertebrata, including Polyzoa, Anellida, Cirripedia, Pycnogonidia, Caprellidae and a single species of Anisopoda.

The latter, which has apparently heretofore escaped notice, was found in numbers inhabiting minute tubes in the crevices between the scales of the turtle's carapace. When unmolested, these little crustaceans could be seen crawling carefully about among their fellow voyagers or lying at the mouths of their domiciles with only the head and cheke projecting; when disturbed they promptly retreated out of sight. I am unaware of any other species of the family Tanaidæ occupying a similar position.

Though differing in some slight particulars from the genus *Tanais* as re-constituted by Sars, the sum of its characters evidently places it in that genus and I propose for it the name *Tanais robustus*.

It is quite robust for the family, being less than $3\frac{1}{2}$ times as long as broad. The carapace, which is the broadest portion of the body, is terminated anteriorly by a minute rostrum, whilst its posterior border is somewhat concave in the middle line. In front of the origin of the great gnathopods the lateral outline is strongly concave, but opposite the bases of these limbs it becomes swollen. When viewed dorsally, the carapace appears, in general figure, top-shaped. Two grooves, one on each side, indicate upon the dorsal surface the inner boundary of the branchial chamber. Behind the carapace the breadth of the body becomes gradually less with each successive segment. The fourth free segment of the pereon is the longest, slightly exceeding the third, which is in turn longer than the fifth.

The pleon is composed of six distinct segments, of which the fourth and fifth are much shorter than the others and the sixth is terminated, posteriorly, by a blunt median projection. The body is constricted at the joints and the segmentation is distinctly marked. The dorsal surface is furnished, laterally, with a few setæ, which on the first and

second segments of the pleon form a short row on each side, but never form a transverse band crossing the segment.

The eyes and eye-lobes are large, the latter being let into deep recesses in the anterior lateral portion of the carapace.

The antennulæ consist of three joints, of which the basal one is somewhat longer than the other two combined. A small knob (rudimentary flagellum) terminates each. In the male the antennulæ usually about equal in length the carapace with the first free segment, but are sometimes considerably longer. In the female they are about equal to the carapace alone.

The antennæ lie close beneath the antennulæ, by which they are slightly exceeded in length in both male and female. They are five-jointed, the fourth joint being the longest, slightly exceeding the second; the fifth, third and first following in the order named, the last mentioned being very short. Each antenna is terminated by a densely setiferous rudimentary flagellum considerably longer than that of the antennules and sometimes imperfectly articulated.

The mandibles are of the usual form, curved inwards at the tip where each bears a pair of horny teeth, shaped like the limbs of the letter U. Proximad of the middle, a stout transverse column passes mediad bearing at its end an oval molar plate traversed by a series of parallel ridges with deep grooves between. Under a high power each ridge appears to be broken up by shallow indentations into a series of rounded teeth.

The first maxillæ consist of a stout forwardly directed column and a posteriorly directed palpus, bearing at its end a brush of seven or eight long setæ. The anterior ramus is stout and curved towards the median line, bearing at its tip a group of about eight stout, curved spines, each with two series of fine, apically directed, denticuli. A brush of stiff setæ lies near the base, and laterad of, the spines. A smaller group of spines lie on one face near the tip; these are not denticulate and lack the brown color of those in the apical group.

The maxillipeds are adherent basally by means of short, stout hooks. The basal joints are prolonged on their anterior or oral aspects into plate-like processes, which are coupled together in the median line. Each basal joint bears a flattened palpus, consisting of four joints, the terminal three being furnished with long setæ. The distal joint is strongly flexed on the penultimate. A somewhat falciform

branchial epipod is attached to the maxilliped at its base, by means of a slender stalk.

The first gnathopods are strongly chelate in both sexes, but especially so in the males. The "thumb" of the propodite is terminated by a horny tooth and external to and just within this is a sharp-edged tubercle; the tooth of the dactylopodite bites between these two. Figs. 6 and 6a, Plate V, show the gnathopods of male and female side by side and give a better idea of their appearance than can be gained from a description.

The limbs of the first free segment of the pereon are long and slender, their terminal claws being but slightly curved. The two succeeding pairs are stouter, with the dactylopodite and claw shorter than in the first pair. The last three pairs are still stouter, the dactylopodite bears a strongly hooked claw with a comb-like series of minute curved teeth on each side and the distal end of the propodite bears a row of stout setæ. All the limbs except those of the first free segment have the distal end of the carpopodite crowned with a few stout spines, some bifid, others serrulate.

Only the anterior three segments of the pleon bear limbs (pleopods). Each of these consists of a flat basal piece (protopodite) to which are attached two one-jointed blades furnished, on their outer edges, with long pinnate setæ, the exopodite bearing about 35, the endopodite about 15. Both protopodite and endopodite bear a single stout seta on their inner edge.

The last segment bears a pair of four-jointed setose limbs (uropods), the segments of which are cylindrical and increase in length from base to tip.

The marsupia of the female are thin walled pouches attached to the ventral wall of the sixth thoracic segment (fourth free segment). They increase in size with the development of the eggs and in some specimens extend over segments five and seven, to which, however, they are not attached.

The largest specimens collected measure from rostrum to tip of pleon 4.7 mm. and in width 1.4 mm. The ground color in alcoholic specimens is pale yellow. Upon the carapace this is heavily mottled with brownish pigment, excepting over about thirty elliptical and sub-elliptical areolæ symmetrically arranged towards the middle line. The dorsal surfaces of the chelæ are similarly marked. The portion of

the body and the limbs behind the carapace are much paler, being usually concealed in the tubular dwelling.

Nine species of Tanaidæ have been previously recorded from the western shores of the North Atlantic, namely :

Tanais vittatus Rathke.

T. hirsutus Beddard.

Leptochelia Savignyi Krøyer=(*L. algicola* Harger ♀).

L. dubia=(*L. algicola* Harger ♂).

L. rapax Harger.

L. (?) filum (Stimpson) Harger.

Heterotanais limicola (Harger) Sars.

Leptognathia cæca (Harger) Sars.

Neotanais americana Beddard.

Tanais vittatus, *L. Savignyi* (?) and *L. dubia* (?) have been taken at Great Egg Harbor Bay, New Jersey.

T. hirsutus was dredged by the "Challenger" in 50 to 150 fathoms off Prince Edward Island.

Neotanais americana was dredged by the "Challenger" in 1,250 fathoms about 200 miles southeast of New York.

H. limicola, *L. cæca* and all the species of *Leptochelia* enumerated have been taken on the New England coast.

The genus *Tanais* may be distinguished from all others by the possession of one-branched uropods, pleopods on the first three segments only of the pleon and incubatory sacs at bases of the fifth pair of limbs. Sars in his re-definition of the genus says, "uropoda brevica, simplicia, ramo singulo bi-vel tri-articulato." His figure of *T. carolinii* possesses four joints, though Milne Edward's figure has but three. *Tanais (Zeuxo) Westwoodiana* has six joints, *T. hirsutus* has twelve and *T. nova zealandæ* has five, one more than the species just described.

T. robustus differs from *T. vittatus*, the only other New Jersey member of the genus, by its greater robustness and tapering body, by the possession of one more joint in the pleon and in the absence of setiferous bands crossing the first two segments of the pleon.

In the foregoing reference is made to the following papers :

Beddard, F. E. "Challenger" Reports. Isopoda—1886.

Harger, O. Report on the Marine Isopoda of New England and Adjacent Waters. Report of U. S. Fish Commission, 1878.

Norman, A. M. and Stebbing, T. R. R. On the Crustacea Isopoda of the "Lightning," "Porcupine" and "Valorous" Expeditions. Transactions Zoölogical Society of London, 1886.

Sars, G. O. Revision der Gruppen; Isopoda Chelifera. Arch. f. Mathematik, Vol. VII.

Stebbing, T. R. R. A History of Crustacea. New York, 1893.

DESCRIPTION OF PLATE V.

- Fig. 1. Dorsal view of male.
- Fig. 2. Antenna of male.
- Fig. 3. Mandible. 3a a portion of molar surface in section.
- Fig. 4. First maxilla with its backwardly directed palp terminated by long setæ. 4a, apical portion of maxilla, showing the apical and sub-apical groups of spines and the auxiliary brush of stiff bristles.
- Fig. 5. Maxilliped.
- Fig. 6. First gnathopod of male; 6a of female. The basal joint is not shown.
- Fig. 7. Limb of first free thoracic segment.
- Fig. 8. Last thoracic limb.
- Fig. 9. Pleopod.
- Fig. 10. Uropod.